

**Claims:**

2           1.    A method for assigning Orthogonal codes in a code  
3 division multiple access network, comprising:  
4           determining that there is a need to reuse a code within  
5 a defined cell area; and  
6           determining an optimal mobile station whose Orthogonal  
7 code is to be reused.

1           2.    The method of claim 1 further comprising defining a  
2 plurality of zones.

1           3.    The method of claim 2 further comprising statically  
2 building a ranked list of zones according to interference  
3 there between.

1           4.    The method of claim 2 further comprising statically  
2 building a ranked list of zones according to angular  
3 separation.

1           5.    The method of claim 2 further comprising defining a  
2 ranked list of zones according to interference between zones  
3 and according to angular separation between zones.

1        6.    The method of claim 5 wherein zones in which side  
2 lobes are present for a primary lobe in a zone in which the  
3 reused code is to be assigned are eliminated from the ranked  
4 list.

1        7.    The method of claim 6 wherein the mobile station is  
2 selected by considering, at least in part, whether the mobile  
3 station is a fixed wireless access user.

1        8.    The method of claim 6 wherein the mobile station is  
2 selected by considering, at least in part, its speed.

1        9.    The method of claim 6 wherein the mobile station is  
2 selected by considering, at least in part, its direction of  
3 travel.

1        10.   The method of claim 6 wherein the mobile station is  
2 selected by considering, at least in part, its location.

1        11.   The method of claim 6 wherein the mobile station is  
2 selected by considering, at least in part, its call duration  
3 length.

1        12. The method of claim 6 wherein the mobile station is  
2 selected by considering, at least in part, its frame error  
3 rate.

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1        13. The method of claim 6 wherein the mobile station is  
2 selected by considering, at least in part, its power  
3 consumption level.

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1        14. The method of claim 6 wherein the mobile station is  
2 selected by considering, at least in part, a known  
3 interference between the mobile station and the mobile  
4 station to whom the code is to be reassigned.

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1        15. The method of claim 6 wherein the mobile station is  
2 selected by considering, at least in part, a correlation of  
3 its time and speed.

1        16. The method of claim 6 wherein the mobile station is  
2 selected by considering, at least in part, whether a  
3 hysteresis is in effect for the user.

1        17. The method of claim 6 wherein the mobile station is  
2 selected by considering, at least in part, according to  
3 whether the call is a data or voice call.

1 18. The method of claim 6 wherein the mobile station is  
2 selected by considering, at least in part, whether, if the  
3 call is a data call, whether it is bursty or continuous.

1 19. The method of claim 1 wherein the need to reuse an  
2 Orthogonal code occurs because of a determination that a  
3 collision is eminent between the two mobile stations using  
4 the same Orthogonal code.

1 20. The method of claim 19 wherein the need is  
2 determined prior to the occurrence of an actual collision.

1 21. The method of claim 19 wherein the determination is  
2 made by considering whether the frame error rate is  
3 increasing.

1 22. The method of claim 19 wherein the determination is  
2 made by considering whether the power usage is increasing.

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1           23. The method of claim 19 wherein the determination is  
2 made by considering whether there is a significant change in  
3 speed.

1           24. The method of claim 19 wherein the determination is  
2 made by considering whether there is a significant change in  
3 direction.

1           25. The method of claim 19 wherein the determination is  
2 made by considering whether a handoff is occurring to a non-  
3 compatible zone.

1           26. The method of claim 19 wherein the determination is  
2 made by considering whether the mobile station is moving  
3 towards the cell center.

1           27. The method of claim 19 wherein the determination is  
2 made by considering whether the mobile station is too close  
3 to the cell center.

1           28. The method of claim 19 wherein the determination is  
2 made by considering whether the signal quality falls below a  
3 specified threshold.

1           29. A method for assigning an Orthogonal code in a code  
2 division multiple access network, comprising:

3           determining that a need exists to reuse an Orthogonal  
4 code that is already assigned to a mobile station for  
5 creating a communication channel;

6           evaluating at least one of zone interference, zone  
7 separation and mobile station characteristics for those  
8 mobile stations that already have been assigned Orthogonal  
9 code and selecting an Orthogonal code to be reused and  
10 assigning the selected Orthogonal code to a mobile station  
11 that is requiring an Orthogonal code.

1           30. The method of claim 29, wherein the candidate donor  
2 mobile station's characteristics that are evaluated include  
3 at least one of whether the candidate donor mobile station is  
4 a fixed wireless access user, its speed, its direction, the  
5 candidate donor location, the candidate donor's call  
6 duration, the candidate donor's frame error rate, the  
7 candidate donor's power consumption, whether the candidate  
8 donor is transmitting data or voice, if the candidate donor  
9 is transmitting data, whether it is bursty or continuous  
10 data.

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1           31. The method of claim 28, wherein selecting a donor  
2 mobile station includes selecting an Orthogonal code for a  
3 mobile station whose location is in a zone that has  
4 significant angular separation from the zone in which a  
5 requesting mobile station is located when the requesting  
6 mobile station is the one needing to reuse an Orthogonal  
7 code.

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1           32. The method of claim 28, further comprising  
2 monitoring the Orthogonal code mobile station characteristics  
3 for the two mobile stations using the same Orthogonal code to  
4 determine whether a likelihood of a collision is increasing  
5 beyond a specified threshold.

1        33. A base station transceiver system for assigning  
2        Orthogonal codes to create communication channels in a code  
3        division multiple access network, comprising circuitry for  
4        performing routine base station transceiver system  
5        operations; and  
6        logic circuitry for selecting an Orthogonal code for  
7        reuse from a mobile station located in a cell portion  
8        according to the location of the mobile station and specified  
9        mobile station characteristics.

1        34. The base station transceiver system of claim 34,  
2        wherein the cell portion that is selected for initially  
3        evaluating mobile stations for donating their Orthogonal code  
4        for reuse includes evaluating the angular separation between  
5        the cell portion and a cell portion in which the code is to  
6        be reused.